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FRC 700.777 v1.0 - μ Registers: A Nested Scope Model for Scale-Declared Reciprocity

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Abstract

FRC 700.777 defines μ registers as a nested scope model for the FRC corpus. μ0 names the prior ground; μ1–μ4 describe an organism's interior registers; μ5–μ6 its symbolic and witnessing envelope; and μ7 the boundary-shell coupled to what lies outside the declared system. The note distinguishes this map from physical scale selection and from the starred Boltzmann bridge k. A μ label declares where a claim speaks; it neither sets k*, proves cross-register causation, nor transfers evidence between registers. The paper supplies an interface*

> *record for any proposed cross-register study and keeps the canonical physical relation unchanged.*

Paper ID: FRC 700.777. This is a philosophical and formal framework note. It does not establish a new physical law, a hierarchy of beings, a theory of subjective experience, or a mechanism of cross-register causation. It supplies scope discipline for a corpus that contains physical, formal, and symbolic work.

1. Purpose and status

The FRC corpus needs a concise way to state *where* a claim is made without confusing that location with the claim's evidence. The μ-register map serves that purpose.

It is a nested model, not a ladder. It is useful when a reader needs to distinguish a physical result from a formal model, a physiological observation from a symbolic interpretation, or a system boundary from what lies beyond it. The map does not rank these registers by truth, maturity, or causal power.

This note is a framework convention. Its test is clarity and disciplined use in future work. It must not be cited as evidence for a physical prediction.

2. The nested model

The model can be pictured as an egg, while remaining a scope convention rather than a literal anatomical or cosmological claim.

Register	Nested role	Working use
μ0	Prior ground	The background condition from which a declared system is considered.
μ1	Interior	Physical and atomic observables: fields, atoms, quantum systems, thermodynamics.
μ2	Interior	Cellular and living structure: metabolism, physiology, and organization.
μ3	Interior	Affective and neural dynamics: feeling and embodied regulation.
μ4	Interior	Logical and conceptual structure: formal reasoning, explicit models, and computational design.

μ5	Envelope	Archetypal and symbolic forms: myths, symbols, and meaning-bearing cultural patterns.
μ6	Envelope	Witness: the reflective stance that observes and relates active registers.
μ7	Shell / interface	The declared boundary and its connection to what lies outside the system or total context.

For an organism-specific reading, μ1–μ4 are its interior, μ5–μ6 are its symbolic and witnessing envelope, and μ7 is its shell. A technical system need not instantiate every register. A Standard Map study, for example, is a μ1 physical-model study; it does not acquire μ2–μ7 claims merely because the map exists.

3. What μ does and does not do

A μ label has three functions:

1. **Scope:** it declares the register in which a page, observable, or claim is speaking.
2. **Boundary discipline:** it prompts the author to name what belongs inside the declared system and what is represented as outside it.
3. **Reading discipline:** it prevents a result in one register from being silently used as evidence in another.

It has no independent physical force. In particular, the following inferences are invalid without a separately declared mechanism and measurement protocol:

- a μ1 result therefore proves a μ3, μ5, or μ6 result;
- a μ4 model therefore establishes a physical process at μ1;
- a symbolic interpretation at μ5 therefore changes a physical observable at μ1;
- a register label therefore determines an entropy, coherence channel, or numerical constant.

4. μ registers and the canonical relation

FRC's canonical relation remains

$$dS + k^* d\ln C = 0. \tag{1}$$

Its form is scale-invariant. The starred Boltzmann bridge k^* makes a declared entropy channel and logarithmic coherence channel commensurable. It is not an outcome-fitted parameter or an evolving state variable.

The μ map and k^* answer different questions:

Question	μ register	Physical realization of k^*
Where is this claim speaking?	Declares the nested register and scope.	Does not answer this question.
What system and boundary are modeled?	Prompts the declaration.	Requires the declaration before use.
What quantities are commensurated?	Does not select them.	Requires declared S, C, units, and convention.
Is there physical evidence?	Does not provide evidence.	Must be assessed in the particular measured or simulated realization.

At a declared physical operational realization, authors may use indexed notation such as

$$dS_{\mathcal{O}} + k^*_{\mathcal{O}} d\ln C_{\mathcal{O}} = 0, \tag{2}$$

where $\mathcal{O}$ denotes the fully declared observational realization: system, boundary, channels, units, and sign convention. This notation deliberately avoids treating the μ-register label as a numerical scale parameter. A μ1 study may have multiple realizations; a μ4 model may describe one of them. Neither relationship makes μ an adjustable value of k^*.

Equation (1) remains operational bookkeeping and a control-law form at a declared boundary. Its extension as a universal physical law for real open systems remains conjectural, as stated in FRC 566.001 and FRC 100.000.

5. Register-interface record

Any paper that proposes a relation across registers must include an interface record before drawing a conclusion. The minimum record is:

Field	Required declaration
Source register	Where the initiating observable or claim is located.
Target register	Where the proposed consequence is measured or interpreted.
Declared system and μ7 boundary	What is inside, what is represented outside, and which exchanges are modeled.
Mechanism	A concrete coupling, transformation, or inferential rule; analogy is not enough.

Observables and units	Measured variables, sampling procedure, and normalization.
Null or baseline	What result would occur without the proposed interface.
Uncertainty and alternatives	Error sources, confounds, and competing mechanisms.
Claim status	Definition, formal result, model-specific result, conjecture, or philosophical interpretation.

Without this record, a cross-register statement is a metaphor, interpretation, or research question. It is not an established mechanism.

6. Two legitimate uses

6.1 A μ1 physical study

FRC 100.002 studies the Standard Map and Quantum Kicked Rotor family. Its coherence channel, entropy estimator, controls, and numerical units are declared in the model. The μ1 label states that its evidential content concerns the physical and mathematical behavior of that declared model. Its simulations do not establish claims about organisms, symbolic structures, or witnessing.

6.2 A μ4 formal study

An implementation may encode the same declared μ1 model in software. The code, proof obligations, and numerical analysis are μ4 work. They can validate whether the implementation reproduces the specified model. They do not independently validate that the modeled physical system obeys the proposed relation. Physical validation remains an empirical μ1 task.

These two uses show the role of the map: it separates model, implementation, and physical inference while retaining their explicit interfaces.

7. What would improve or defeat this note

This note should be revised if its register names create more ambiguity than they remove, if its interface record cannot be applied consistently to actual papers, or if a clearer scope notation replaces it.

The note does not predict a new numerical result. A future cross-register program would need its own pre-registered observables, mechanisms, baselines, and failure conditions.

Passing or failing such a program would assess that program, not turn the μ map itself into a physical law.

8. Reading rule

Use μ labels to ask four questions before interpreting a claim:

1. Which register is being addressed?
2. What system and μ7 boundary have been declared?
3. Which observables, units, and evidence support the claim?
4. Is any movement between registers a measured mechanism, a formal mapping, or only an interpretation?

This rule preserves the FRC project's philosophical range while keeping its physical claims answerable to physical evidence.

Connections

- [[FRC-100-000]] - current canonical stance and version rules
- [[FRC-566-001]] - reciprocity notation, operational realization, and boundary discipline
- [[FRC-566-030]] - exact system-only von Mises identity
- [[FRC-100-002]] - declared μ1 chaos and localization program
- [[FRC-100-011]] - terminology and claim-status crosswalk
- [[mu-levels]] - public register map
- [[mind-open-systems]] - philosophical context for openness and mind

Version note

Version 1.0 establishes the initial 700-series framework note. It does not reactivate archived 700-series consciousness or simulation material, and it does not alter the 100- or 566-series canonical physical claims.